Continued Progress in Agronomic Services
Agronomic Division — 2004 Annual Report
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North Carolina is losing some of its best and most productive farmland at an increasingly alarming rate, making the need to improve crop productivity and efficiency on remaining acres even more important. The pressure to increase productivity must be balanced with careful environmental stewardship. Proper nutrient management using science-based agronomic principles and technologies helps growers make informed decisions to preserve and protect our natural resources. For these reasons, thousands of North Carolina residents continue to use the analytical and advisory services provided by the Agronomic Division to enhance plant growth, productivity, profitability and environmental quality.

Service

In fiscal year 2003-04, Agronomic Division laboratories processed more than 349,000 soil, nematode, plant tissue, waste and solution samples, and issued more than 52,000 advisory reports. The workload included about 29,000 more samples than last year, probably due to a combination of better weather and implementation of the revised Natural Resources Conservation Service (NRCS) 590 Nutrient Management Standard and the new N.C. Phosphorus Loss Assessment Tool. The soil testing and waste analysis laboratories continued to operate under the N.C. Department of Environment and Natural Resources (DENR) Division of Water Quality's wastewater certification program and are qualified to provide critical testing for animal waste permit and nutrient management compliance. A project to reprogram all laboratory workstations for compatibility with Windows XP is well underway and will continue into 2005.

Technical staff provided about 10,000 farmers, homeowners and agribusiness leaders with technical advice and recommendations for efficient crop fertilization, plant nutrition, biosolid land applications and effective nematode management. Regional agronomists throughout the state participated in dealer training; conducted on-site assessments for growers; assisted with land management and plant growth problems; and counseled producers on using proper fertilizers, making sound economic decisions, and implementing nutrient management plans.

Regional agronomists responded to hundreds of requests regarding environmental issues — primarily waste management plan clarifications, regulatory updates, and river basin oversight reviews — and participated in local advisory committees. Agronomists also provided technical expertise, service, and/or training for several regional and statewide environmental projects in cooperation with DENR, North Carolina State University (NCSU), N.C. A&T State University and USDA-NRCS.

The **Soil Testing Section** analyzed more than 281,000 samples and provided fertilizer and lime recommendations for more than 100 crops. The lab achieved a significant milestone this year in being able to consistently process 75 sets per day—a 15% increase in capacity! This achievement was due largely to new equipment purchased through an NRCS grant, including an automated humic matter station, a new inductively coupled plasmaspectrometer (ICP), and a fourth pH station. In addition, a new quality control program has been implemented to measure data accuracy and track errors to specific workstations. So far, the error rate has proved to be very low—1% or less.

The soil testing laboratory continues to participate in the North American Proficiency Testing Program administered through the Soil Science Society of America and American Society of Agronomy. Dr. David H. Hardy, Soil Testing Section Chief, is also serving the second of a three-year term on the Soil and Plant Analysis Council. In November, Hardy attended the annual board meeting held in conjunction with the American Society of Agronomy meetings in Seattle, WA.

The **Plant/Waste/Solution Section** analyzed 15,201 plant tissue, 20,023 waste, and 2,089 solution samples. The laboratory upgraded the hoods in the grinding room and installed a new sample dryer. These changes improve our productivity and increase worker safety.

Of the 30,419 samples processed by the **Nematode Assay Section**, 89 were diagnostic samples analyzed for the Plant Disease and Insect Clinic at NCSU and 624 were regulatory samples for the NCDA&CS Plant Industry Division.

Given the potential for nematode damage and economic loss, most major crops in North Carolina are undersampled. Soybean cyst nematode is the number-one disease problem in soybean, yet less than 11 percent of soybean acreage is sampled for this pest. Growers of cotton, sweetpotatoes, tobacco and vegetable crops continue to be the primary beneficiaries of this valuable service.

Education

Agronomic Division staff, especially the **Field Services Section**, reach thousands of growers, homeowners and agricultural professionals through a wide range of educational activities. Staff conducted 25 laboratory tours for farmers, master gardeners, agribusiness groups, scientists and students, including a 65-person delegation from Honduras. Information on agronomic services was disseminated through 38 educational exhibits displayed at farm shows, field days, training events, professional meetings and symposia.

Outreach also included 2 radio interviews and 17 news releases in addition to articles in magazines and newsletters like *Limbs and Needles*, *Southeast Farm Press*, *The Leader* (Carolina Farm Credit newsletter), the *North Carolina Farm Bureau* magazine, *The Strawberry Grower*, and *Wildlife in North Carolina*. About 50 presentations on agronomic services were made to master gardeners, growers, commodity associations, conservation groups, and county and state organizations.

Division staff authored or collaborated on 21 technical publications. New division brochures/fact sheets include *Agronomic services: essential tools for nutrient management, Agronomic services for grape production, Fertilizing wildlife food plots, Managing crop residue,* and *Strawberry tissue analysis*. Dr. David H. Hardy received a "Certificate of Excellence" from the American Society of Agronomy at its November meeting in Seattle for his collaboration with Dr. Carl Crozier of NCSU on the publication *Soil facts: soil acidity and liming for agricultural soils,* which was recognized in the category of outstanding educational materials of 16 pages or less.

Safeguarding environmental quality continues to be a top priority. In 2004, staff cooperated with the following agencies to provide information related to biosolid land application and training in use of agronomic services, proper sampling techniques, and common soil and crop fertility problems:

- DENR — spray irrigation and biosolid application schools;
- NCSU — nutrient management training for certified technical specialists;
- Cooperative Extension Service — new agent training.

In addition, staff made several presentations to school children (grades 3–8) on the subjects of soils and environmental issues.

Division staff participated in at least 27 local, state, regional or national meetings. These included

- the 41st Tobacco Worker's Conference in Nashville, TN (January 2004)
  - presentation: *Field evaluation of organic flue-cured tobacco transplants*
  - presentation: *Plant tissue analysis: an aid to flue-cured tobacco quality*
- N.C. grape producers' meetings in Winston-Salem and Greenville (February 2004), Albemarle (August 2004), and Dobson (November 2004)
  - presentation: *Agronomic services for state vineyards*
- the First Annual NEMAC Workshop: Exploring Applications of Environmental Modeling in the Southern Appalachians held at the National Environmental Modeling and Analysis Center in Asheville (May 2004)
  - presentation: *Potential roles for the NEMAC in agriculture and conservation*
- the 96th annual meeting of the American Society of Agronomy in Seattle, WA (October/November 2004)
  - poster: *Soil test phosphorus: trends relative to dynamics in North Carolina agriculture*.

Research

Agronomic staff routinely conduct studies with university personnel, farmers and industry specialists. The laboratories processed 1,817 soil samples, 6,346 plant/waste/solution samples and 1,516 nematode assays for cooperative research. Regional agronomists conducted about 60 research and demonstration projects in fields throughout the state. These projects were designed primarily to optimize fertilizer rates, waste utilization, sampling procedures, and use of organic material as nutrient sources.

During 2004, staff conducted specific field studies on

- comparison of manganese sources under high pH conditions,
- effects of high soluble salts on vegetable crops (as related to hurricane aftermath),
- use of plant tissue analysis to assess tobacco leaf quality and ripeness,
- production of organic tobacco,
- fertigation of trellis tomatoes grown under plastic,
- root-knot nematode management with nematicides and amendments,
- evaluation of new nitrogen forms on cotton and corn,
- nematode populations in the southern piedmont,
- potassium and calcium interaction on peanuts,
- zinc toxicity on peanuts,
- response of corn to chicken litter,
- the use of new crop codes for wildlife food plots.